Amendments to the Claims

Please amend the claims as follows:

1. (Original) A method of fabricating a gallium nitride-based semiconductor structure on a substrate, the method comprising:

forming a mask having an opening on said substrate;

growing an epitaxial layer selected from the group consisting of gallium nitride and Group III nitride alloys of gallium nitride vertically from the opening and laterally across the mask; and

maintaining the lateral growth rate of said epitaxial layer at a rate sufficient to prevent polycrystalline nitride material nucleating on the mask from interrupting the lateral growth of said epitaxial layer.

2. (Original) A fabrication method according to Claim 1 comprising maintaining the lateral growth rate greater than the vertical growth rate.

3. (Original) A fabrication method according to Claim 1 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 1 :1.

4. (Original) A fabrication method according to Claim 1 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate at between about 1:1 and 4.2:1.

5. (Original) A fabrication method according to Claim 1 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 4.2:1.

6. (Original) A fabrication method according to Claim 3 comprising maintaining the lateral growth rate at between about 2 and 8 microns per hour.

7. (Original) A fabrication method according to Claim 1 wherein the substrate comprises silicon carbide.

8. (Original) A fabrication method according to Claim 1, further comprising:

growing a buffer layer through the opening in the mask, wherein said buffer layer will support the epitaxial growth of Group III nitrides thereon.

9. (Original) A fabrication method according to Claim 8 wherein the step of growing the buffer layer comprises growing a layer of $Al_xGa_{1-x}N$ where $0 \leq x \leq 1$.

10. (Original) A fabrication method according to Claim 9 wherein the buffer layer forms a conductive interface to the substrate.

11. (Original) A method of fabricating a gallium nitride-based semiconductor structure on a substrate, the method comprising:

forming a mask having an opening therein on a substrate;

growing an epitaxial layer selected from the group consisting of gallium nitride and Group III nitride alloys of gallium nitride vertically from the opening and laterally across the mask under conditions such that polycrystalline nitride material is not inhibited from nucleating on the mask;

wherein the laterally growing epitaxial layer overgrows the polycrystalline nitride material.

12. (Original) A fabrication method according to Claim 11 comprising maintaining the lateral growth rate greater than the vertical growth rate.

13. (Original) A fabrication method according to Claim 11 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 1:1.

14. (Original) A fabrication method according to Claim 11 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate at between about 1:1 and 4.2:1.

15. (Original) A fabrication method according to Claim 11 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 4.2:1.

16. (Original) A fabrication method according to Claim 13 comprising maintaining the lateral growth rate at between about 2 and 8 microns per hour.

17. (Original) A fabrication method according to Claim 11 wherein growth of the epitaxial layer is performed at about 1060 to 1120° C.

18. (Original) A fabrication method according to Claim 11 comprising forming the mask on a silicon carbide substrate.

19. (Original) A fabrication method according to Claim 18 comprising forming a striped mask oriented along the <1100> direction on the (0001) surface of the SiC substrate.

20. (Original) A fabrication method according to Claim 11, further comprising:

growing a buffer layer through the opening in the mask, wherein said buffer layer will support the epitaxial growth of Group III nitrides thereon.

21. (Original) A fabrication method according to Claim 20 wherein the step of growing the buffer layer comprises growing a layer of $Al_xGa_{1-x}N$ where $0 \leq x \leq 1$.

22. (Original) A fabrication method according to Claim 21 wherein the buffer layer forms a conductive interface to the substrate.

23. (Original) A fabrication method according to Claim 20 comprising growing the buffer layer to a thickness greater than the thickness of the mask.

24. (Original) A fabrication method according to Claim 11 comprising growing the epitaxial layer by vapor phase epitaxy using one or more source gases selected from the group consisting of trimethyl gallium, trimethyl aluminum, and ammonia.

25. (Original) A fabrication method according to Claim 11 comprising forming a mask that includes a plurality of openings and growing the buffer and epitaxial layers from a plurality of the openings.

26. (Original) A fabrication method according to Claim 25 comprising growing the epitaxial layer until laterally growing portions coalesce.

27. (Original) A method of fabricating a gallium nitride-based semiconductor structure on a substrate, the method comprising:

forming a mask having at least two openings therein on a substrate;

growing a buffer layer on the substrate within the openings in the mask; and

growing an epitaxial layer selected from the group consisting of gallium nitride and Group III nitride alloys of gallium nitride upwardly from the buffer layer and laterally across- the mask;

while maintaining the horizontal growth rate of the gallium nitride layer at a rate sufficient to prevent polycrystalline material nucleating on the mask from interrupting the lateral growth of the gallium nitride layer until the lateral growth from the openings coalesces; and

thereafter continuing to grow the epitaxial layer vertically.

28. (Original) A fabrication method according to Claim 27, further comprising:

after the lateral growth from the openings coalesces, increasing the rate of vertical growth of the coalesced epitaxial layer.

29. (Original) A fabrication method according to Claim 27 comprising maintaining the lateral growth rate greater than the vertical growth rate.

30. (Original) A fabrication method according to Claim 29 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 1:1.

31. (Original) A fabrication method according to Claim 29 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate at between about 1:1 and 4.2:1.

32. (Original) A fabrication method according to Claim 29 comprising maintaining the ratio of the lateral growth rate to the vertical growth rate greater than about 4.2:1.

33. (Original) A fabrication method according to Claim 30 comprising maintaining the lateral growth rate at between about 2 and 8 microns per hour.

34. (Original) A fabrication method according to Claim 27 comprising masking the substrate using a technique selected from the group consisting of plasma-enhanced chemical vapor deposition, sputtering, reactive sputtering, electron-beam deposition and thermal oxidation.

35. (Original) A fabrication method according to Claim 27 comprising masking a SiC substrate.

36. (Original) A fabrication method according to Claim 27 wherein the step of growing the buffer layer comprises growing a layer of $Al_xGa_{1-x}N$ where $0 \leq x \leq 1$.

37. (Original) A fabrication method according to Claim 36 wherein the buffer layer forms a conductive interface to the substrate.

38. (Original) A fabrication method according to Claim 36 comprising growing the buffer layer by vapor phase epitaxy using trimethyl gallium, trimethyl aluminum, and ammonia as the source gases.

39. (Original) A fabrication method according to Claim 27 comprising growing the buffer layer to a thickness greater than the thickness of the mask.

40. (Original) A fabrication method according to Claim 27 comprising growing the epitaxial layer by vapor phase epitaxy using one or more source gases selected from the group consisting of trimethyl gallium, trimethyl aluminum, and ammonia.

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